Chapter 11

Wholesale Water

This chapter sets out our plans for the Wholesale Water Resources and Water Networks Plus price controls. Each price control is described within its own section.

In AMP7, we have started to shift our focus towards creating a customer-led business. This is reflected in our choices, goals and performance commitments outlined in this chapter, and elsewhere across the Business Plan.

Wholesale Water Resources

Summary

This section sets out our plans for the Wholesale Water Resources price control. It describes how we will deliver our customers' priorities, the options we have assessed and how we will deliver these plans efficiently.

We supplied 541 million litres of high-quality drinking water every day to over 2.5 million customers in parts of Hampshire, Sussex, Kent, and the Isle of Wight during 2017-18. Our current average per capita consumption (PCC) and leakage figures are among the lowest in the UK[1]. Wholesale Water comprises around 30% of total regulated revenues.

Our climate is becoming drier, our population is growing and we need to leave our environment in a better state than we found it[2]. Without action, we predict a supply and demand deficit across our region of 294 megalitres per day (Ml/d) by 2030, with a deficit of 188 Ml/d in Hampshire alone[3]. In the short term we are reliant on drought orders and permits to meet this deficit. Therefore, we need to adapt to secure a resilient water future for the South East.

We currently put less water into supply than we did at privatisation – despite significant population and housing growth. Focussing on leakage reduction and supporting customers to reduce PCC has achieved a 16% reduction in demand[4]. However, in some of our supply areas, particularly Hampshire, we have had to defer some of the proposals in our last Water Resources Management Plan (WRMP), due to environmental investigations and abstraction licencing issues.

We are leading the reinvigoration of Water Resources South East looking 80 years into the future to deliver regional infrastructure which safeguards water supplies. As part of this we commissioned a report from futurist Peter Kingsley called Water Futures in the South East: Towards 2050. This report identified the major long terms trends facing the region. We are responding with innovative, long term thinking and collaboration such as our ***Target 100*** programme, and the Havant Thicket Reservoir.

The WRMP process models thousands of potential futures, uses 'real options' assessments and incorporates customers' and other stakeholders' views to develop resilient, flexible solutions which meet our region's priorities[5]. This resulted in a triple-track approach[6] to ensure that our services are resilient to a one in 500-year drought – beyond the statutory minimum of a one in 200-year event and aligned with the strategic direction adopted by the National Infrastructure Commission[7].

Firstly, we are driving down demand by supporting customers to deliver an industry-leading reduction in consumption, while delivering our biggest-ever programme of leakage reduction – reducing leakage a further by 15% by 2025 and 50% by 2050. This will result in demand reduction of 54 Ml/d by the end of AMP8, as detailed in the Wholesale Water Networks Plus section.

Secondly, we are securing resilient new supplies through a combination of water-reuse schemes, desalination plants, the joint-use Havant Thicket reservoir (with Portsmouth Water) and more resilient supply systems, as a result of our ***Network 2030*** programme. Our proposed supply-side solutions will secure an additional 208 Ml/d by the end of AMP8.

Thirdly, we are using catchment management to protect our existing water sources. Under our ***Catchment First*** programme, we will deliver improvements to the Rivers Test, Arun and Western Rother, and Medway and strengthen vital relationships such as the Brighton Chalk Management Partnership (ChaMP). While our reliance on drought orders and permits to ensure supply continues through AMP7, by the end of AMP8 we will have fully addressed the deficit.

Chapter headlines at a glance

- By providing better information, advice and incentives we will support customers to understand the value of water and achieve ***Target 100*** by 2040, starting by reducing PCC to 120 litres by 2025
- Securing a resilient water future for the South East requires cross-boundary collaboration. Working with Portsmouth Water, we have developed joint proposals for the new Havant Thicket reservoir. This will enable a bulk transfer of 21 Ml/d[8] to support regional resilience
- Improving our ability to move water to where it is most needed is critical. In AMP7 we will start work on the Hampshire Water Grid – the first step towards our vision of a Regional Water Grid across the South East[9]
- While it is crucial that we create new supplies, it is equally important to protect the sources we have. Through ***Catchment First*** we will resolve issues in catchments by working with farmers and landowners to encourage sustainable land management. This will improve rivers, reduce water quality risks and deliver wider social benefits
- Overall we plan to invest £1,321 million[10] in Wholesale Water (£1,202 million net of grants and contributions), this compares to an AMP6 investment of £990 million net of grants and contributions in 2017/18 prices.
- Our planned Wholesale Water Resources investment is £130 million[11] (£128 million net of grants and contributions), which will enable us to maintain current levels of drought resilience. This compares to AMP6 investment of £151 million net of grants and contributions in 2017/18 prices. A snapshot of the areas of expenditure is shown below.

Figure 1: Overview of Wholesale Water Resources gross expenditure

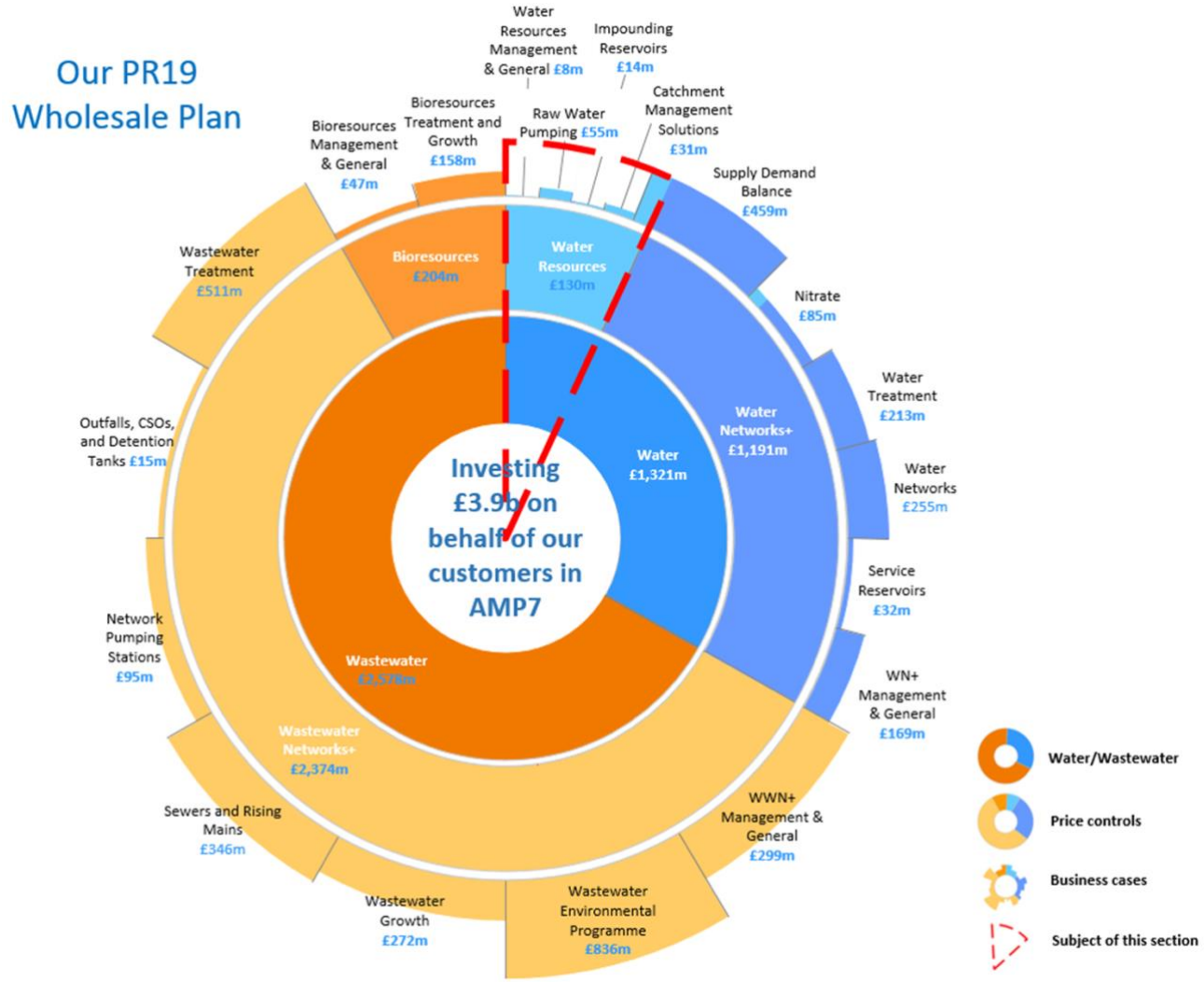


Table 1: Key features of the Wholesale Water Resources price control[12]

	Unit	AMP6 (2019/20)	AMP7 (2024/25)
Costs and Regulatory Capital Value (RCV)			
Totex	£m	151	128
RCV	£m	83.286	-
Performance			
PCC	l/hd/d	131	120
Abstraction Incentive Mechanism	Ml/d	N/a	15
Customers achieving *Target 100*	%	49	55
Water saved from water efficiency visits	m3/d	N/a	2500
Population at risk of severe restrictions in a drought	%	0	0

11.1 Context – Against a background of solid performance, we face significant challenges in the near future

In our AMP6 Business Plan (2015-20) we promised:

- no restrictions on water use, unless there are at least two dry winters in a row
- to reduce leakage to 86 million litres per day by 2020
- to reduce the amount of water we take from the environment
- a 10% reduction in average water use by 2020.

These promises were converted into specific performance commitments (PCs). In 2017/18 we met our commitments on temporary use bans and PCC but missed our targets on Distribution Input. We are on track to meet our five-year average commitment on leakage.

A summary of our performance against our AMP6 Water Resources PCs is shown in the table below. (Full details can be found in Chapter 17.)

Table 2: Wholesale Water Resources AMP6 performance commitments[13]

AMP 6 Performance commitment	Actuals 2017/18	Forecast 2019/20	Target 2019/20
Number of properties affected by temporary use ban	0	0	0
Leakage (Ml/d)*	88.7	86.2	86.0
Distribution Input (Ml/d)	541	536	526
PCC (l/h/d)*	129	131	133

* The definitions of a number of common PCs are changing between AMP6 and AMP7. This affects the calculation of both PCC and leakage and means that the levels quoted in Table 2 are not comparable with those quoted through the rest of this chapter.

Household demand for water has decreased over time. This has been driven by our leakage reduction, metering and water-efficiency programmes, along with lifestyle changes and more efficient water-using devices.

87%[14] of our customers now have a water meter and pay for the volume of water they use. Together with leakage and water-efficiency measures, we've seen water use fall by 16% in the past seven years[15].

As proposed in our 2014 WRMP, we are delivering water efficiency and leakage-reduction schemes. We are also implementing other changes to our water resources network, including new transfers to share resources with neighbouring companies[16].

Although we continue to implement the majority of the other measures included within our last WRMP, two schemes in Hampshire have encountered difficulties. These are a Candover flow augmentation scheme to increase flows on the River Itchen, and the construction of a new pipeline linking our Testwood and Otterbourne treatment works. Both have changed significantly following a planning enquiry in 2018, the outcome of which has been incorporated into our current WRMP and this plan.

Our understanding of customer priorities is based on engagement and has formed the basis of our Business plan

We used insight from our extensive engagement programme to develop a set of 10 outcomes to form the basis of our business plan. Within each outcome are a number of objectives which we will strive to deliver.

Our PCs were derived from our initial view of customer priorities from Phase 1 of our research and validated and refined over the course of our programme of customer engagement. Our success in meeting the outcomes for our customers will be measured by the PCs outlined in this chapter.

The provision of clean, safe drinking water was reported by all customers as the highest priority – both in ensuring water quality, reducing wastage and minimising supply interruptions

- Customers view providing safe, high-quality water as an absolute basic of any water company in the UK. They see it as the most important part of our job, above all else. Customers demonstrate high willingness to pay to enhance water quality from 0.36 instances of non-ideal taste and odour to 0.32 instances, per 1,000 people
- Customers consistently highlight reducing leakage as a high priority. They view leakage as a moral issue, as they believe water is a precious, natural resource that should be looked after and used wisely by both them and us. They express a strong preference for us to be a leader in reducing leakage and demonstrate a significant increase in willingness to pay for improvements, even when we are best in class. Customers report willingness to pay an additional £3.40 per property per year to reduce leakage from our initial measure of 76 litres per household per day to 68 litres per household per day. Leakage reduction has the highest willingness to pay of any proposed measure
- Preventing interruptions is consistently reported as a high priority by customers. Customers find unexpected interruptions to supply an inconvenience and they highlight the importance of communicating any issues. Customers report willingness to pay £1 extra per property per year to reduce the average minutes lost per year, per home from 12 to 11.

Saving water and ensuring the resilience of water for future generations are reported as medium priorities for customers

- Customers believe saving water is a partnership issue. They expect us to focus on reducing leakage, before starting to help them to use water more wisely by providing information and advice. Customers report willingness to pay an additional 90p per property per year to reduce water consumption from 132 to 122 litres per person per day
- Customers expect us to ensure that future generations have access to the same level of water services as we do today, and are, themselves, willing to invest now to ensure that there is no deterioration in services in the future
- Customers had concerns about the impact on the environment and drinking water quality of locally unsustainable abstraction levels and agricultural runoff.

Willingness to pay analysis used 2015/16 performance as the base year, and used AMP6 reporting definitions. (See Chapter 4 and TA.4.01 for customer and stakeholder engagement findings.)

We have assessed the long term needs of government, stakeholders and the environment

Balancing the increased demand for water to support a growing population and protecting the environment from the worst impacts of climate change presents a challenge. The Environment Agency's review of abstraction licences to comply with the EU Habitats Directive could lead to

sustainability reductions during drought conditions in Hampshire of up to188 ML/d, or approximately two-thirds of the water currently available, by 2027[17].

Without mitigation, customers would experience a reduced level of service compared to our target level[18] for at least the next decade, with restrictions on water use potentially needed every two or three years. We tested the acceptability of this reduced level of service and customers indicated a strong preference for maintaining levels of service.

The Government's 25-year Environment Plan sets out a clear vision for reducing the environmental impact of our activities and leaving "our environment in a better state than we found it". The plan enshrines Ofwat's proposed 15% leakage reduction target and outlines further action to reduce the impacts of abstraction while minimising supply interruptions. Our plan fully supports the Government's objectives.

The National Infrastructure Assessment also sets out the need for concerted action to meet the challenges of climate change, population growth and environmental protection. We support the drive towards a twin-track approach, consisting of demand management and supply solutions, but, as previously stated, we feel a triple-track approach, which incorporates proactive catchment management, delivers greater resilience and wider benefits. We have committed to delivering a 50% reduction in leakage by 2050 and, through ***Target 100*** will, with our customers, reach a more ambitious PCC target.

Ofwat's mandatory PCs will enable greater comparison between companies. As a result of methodology changes, both for Ofwat's and industry-wide measures, our comparative industry position will change for a number of metrics. In particular we will no longer be industry leaders for leakage. As detailed above our customers have stated a strong preference for us to lead on reducing leakage, so our plan aims to regain our industry-leading position through AMP7 and 8.

11.2 Our AMP7 goals support long term needs

Our goal is to provide clean, safe water in a sustainable manner, for current and future customers. To achieve this we have set a series of ambitious, long-term targets.

By 2025 we will:

- through ***Target 100*** reduce PCC from 131 litres/head/day in 2019/20 to 120 litres/day[19]
- reduce leakage by 15% from 105.4 Ml/d in 2019/20 to 89.6 Ml/d[20]
- improve water quality compliance to an industry-leading standard[21]
- reduce the impact of our abstractions on sensitive water bodies[22]
- improve network flexibility to increase resilience and respond faster to events[23].

By 2040 we will[24]:

- achieve ***Target 100*** – reducing PCC to 100 litres/day
- reduce leakage by 40% to 65 ML/d and by 50% to 50 ML/d by 2050
- maintain industry-leading water quality performance
- remove 95% of lead communication and mains pipes and 100% by 2045
- increase water reuse and grey water recycling schemes
- achieve industry-leading levels of resilience using intelligent networks.

Our PCs for the AMP7 Wholesale Water Resources price control are summarised below.
(See Chapter 6 for further details.)

Table 3: Wholesale Water Resources AMP7 performance commitments[25]

PC	Unit	2020/21	2021/22	2022/23	2023/24	2024/25
PCC	l/hd/d	127	125	122	121	120
Abstraction Incentive Mechanism	Ml/d	15	15	15	15	15
Customers achieving *Target 100*	%	49	51	53	54	55
Water saved from water efficiency visits	m3/d	500	1000	1500	2000	2500
Risk of severe restrictions in a drought	%	0	0	0	0	0

11.3 How we will get there – Innovation, collaboration and being brilliant at the basics are required for a resilient future

This section sets out how our transformational programmes support delivery of our goals. It also sets out our strategy to deliver improved leakage performance, a key element of our plan. (Also see Chapter 3.)

We also communicated with customers to understand how they wanted service improvements to be delivered in priority areas. Through our engagement programme, we jointly imagined and created initiatives with customers and used this feedback to define how we will act on their priorities. This helped us to shape the initiatives we have designed to deliver our proposed outcomes. (As outlined in Chapter 4.)

Our customers and other stakeholders have told us they want to partner with us to deliver our priorities. They expect us to invest in initiatives that will protect and enhance the environment and ensure that future generations have access to the same level of water services as we do today.

Based on this insight, we have shaped and refined three programmes to support our water resources ambitions (these programmes also support our ambitions in other price control areas)

- ***Target 100*** will cut demand for water by 20 Ml/d which, supported by a 15% leakage reduction, will reduce the need for new water supply solutions
- ***Network 2030*** will provide a more resilient water supply system and includes proposals to develop a Hampshire water grid enabling the transfer of up to 52 Ml/d.
- ***Catchment First*** will improve the drought resilience of the Rivers Test, Arun and Western Rother, and Medway, and carry out 87 investigations to assess the impact on the environment of our abstractions

The subsections and tables below summarise each of these programmes, highlighting work we have been doing, as well as our proposals for AMP7 and beyond.

Target 100: Working with customers to reduce daily PCC to 100 litres by 2040

Our customers view water as a precious, natural resource that should be looked after and used wisely. Our customers are concerned about their water supply being at risk due to growing populations, increasing demand and diminishing resources. Our research shows that customers therefore believe a key priority is ensuring that future generations have the same level of access to drinking water as they do now[26].

Table 4: ***Target 100*** examples

Our response	What we're doing (AMP6)	We will (AMP7)
Smart metering	450,000 meters installed across 87% of customers, with an average 16.5% reduction in consumption[27] . Developing and trialling a low cost smart meter conversion.	Provide clip-on meter conversions to all customers that want one (aligned to access to daily water consumption PC[28]) – up to £2.7m. Replace any failing meters with new smart meters – £20m[29]. Increase meter penetration from 87% to 91% across the region – £13m. Trial new metering technologies in advance of a wider roll-out in AMP8 – £1m[30].
Water efficiency	13,809 home visits completed since April 2015, delivering water savings of between 6-10% per property. Partnering with social housing providers to provide tailored visits to customers with affordability issues. Lobbying for a comprehensive UK Water efficiency labelling scheme. Utilising metering data to target efficiency visits to deliver maximum benefit in our most water-stressed areas.	Complete 100,000 home visits[31], combining water efficiency and customer-side leakage detection to deliver our water saved from water efficiency visits PC target of 2,500m3/d by 2025 – £14m. Carry out free supply pipe repairs or replacement – £5m[32] . Lobby for tighter water efficiency standards in new homes and for all water companies to be able to consider universal metering, thereby maximising demand benefits across the South East.
Customer contact journey	Redesigned bills to provide comparative consumption information. Provided water efficiency information and products on our website Launched Your Account online self-service portal. Customer segmentation analysis to enable a tailored water-efficiency message[33]. Data sharing pilot with Brighton & Hove Council on water efficiency and affordability. Re-establishing water efficiency support for businesses following market reform.	Embed water efficiency through our Great Customer Service proposition[34] – Spring. Enhance our data management systems to provide daily consumption data to customers that want it – £3.3m. Integrate billing and water efficiency messaging.
Customer incentives	Tested community incentives in Abstraction Incentive Mechanism trial resulting in an 8% saving. Provided discounts to developers that build water efficient properties. Partnering with Eastleigh Borough Council to trial an incentive scheme for 52,000 customers.	Provide 1.6 million customers with a comprehensive incentives package to reward lower consumption – £3m. Sign up 40% of our customer base in Hampshire and Sussex in AMP7.

Stakeholders strongly support our ***Target 100*** leadership initiative. Customers are supportive but with the caveat that we also do our part in focusing on reducing leakage. Our plan for reducing leakage is described later.

"It's great to see Southern Water's level of ambition on making the best use of the water we have, set out in ***Target 100***. With tailored support there's no reason why Southern Water's customers can't be the most water-efficient in the country, matching examples across Europe."

Aaron Barton, Director of Policy & Innovation, Waterwise

Some of the key customer findings are detailed below

- Adopting water-saving products was a key customer priority, to help them reduce PCC. Metering is regarded as an efficient method of recording individual water usage, an equitable method of billing by customers and other stakeholders, and may have a positive environmental impact
- Overall, there is strong support for information, advice and guidance for customers, including home visits. Customers believed that water efficiency visits at schools and other institutions would have a bigger impact, due to easier access to a larger amount of people and the great potential to educate customers of the future
- Customers want to receive support across both online and offline channels and expressed a desire for a good quality, functioning website
- Customers want to be rewarded for good behaviour – this resulted in us offering incentives in terms of community projects for local communities who reduce their usage.

(For further detail on customer insight, see Chapter 4 and TA 04.1. For more information on ***Target 100*** see TA.11.WN01.)

Network 2030: Improving resilience and long-term affordability

Customers expect us to ensure that future generations have access to the same level of water and wastewater services as we do today and are willing to invest now to ensure that there is no deterioration in services in the future. Customers wish to minimise the environmental impact of delivering future water and wastewater services and have qualitatively reported being willing to pay for more environmentally-friendly delivery options too, rather than expecting Southern Water to choose the cheapest.

Table 5: ***Network 2030*** examples

Our response	What we're doing (AMP6)	We will (AMP7)
Providing a more resilient network	Detailed investigations in three of our 10 Water Supply Zones to quantify current levels of resilience to supply interruption across both individual assets and across the entire system. Using this resilience quantification to shape our future investment to maximise our asset resilience, which has become the ***Network 2030*** plan.[35]	Implement ***Network 2030*** through AMP7 and AMP8. Spend to save – deliver fewer nitrate schemes by rationalising sites – £80m. Spend to save – deliver fewer service reservoir replacements by redesigning our network – £18m. Utilise smart technologies to monitor and control our water network – £14m. Begin the journey to a fully integrated South East regional water grid by investing in the Hampshire grid – £110m.
Long-term affordability	Assessed how to achieve long-term affordability/inter-generational fairness whilst increasing resilience. Using this assessment in tandem with the resilience assessment to develop the Network 2030 plan.	Implement ***Network 2030***. This includes the rationalisation of assets, more network connectivity and smarter operations – a more resilient and affordable future.

Our customers support our investment priorities in relation to ***Network 2030***. They and our stakeholders have told us that they believe emerging technology will be important in solving the water industry's key issues, including water quality and leakage problems. Our customers are supportive of the use of technology and real-time data to help improve water quality, to reduce leakage and improve the overall quality of the network.

(For more information see TA.11.WN01, TA.11.WN02, TA.11.WN03, TA.11.WN04, TA.11.WN05)

Catchment First: Natural solutions to achieve a more resilient service and environment

All our customer groups agreed that water catchment was one of the preferred methods for protecting and enhancing a high-quality water supply for the future in an environmentally-friendly

manner. Customers supported the idea of stopping harmful chemicals entering our water sources and agreed that water catchment was one of the preferred methods.

Stakeholders support more monitoring to better understand catchment risks and target interventions where they will deliver the most benefit. Stakeholders (DWI, EA and Ofwat) and customers are unanimous in their support for catchment approaches to address water quality risk at source. We have therefore significantly increased the scale of our proposed catchment management solutions, including ensuring that all areas at risk of nitrate quality issues are covered.

Table 6: ***Catchment First*** examples

Our response	What we're doing (AMP6)	We will (AMP7)
In-stream catchment resilience	Following the outcome of the River Itchen and Test Inquiry we have accelerated resilience work to protect and enhance the Rivers Test, Itchen and Candover, focusing on low-flow habitat resilience. A total of £2.8m investment for AMP6 will include mitigation, compensation and monitoring across the three water bodies.	Implement three initial schemes in AMP7 and AMP8 in the Test and Itchen, the Arun and Western Rother and the Medway catchments. Carry out investigations/projects to improve in-stream resilience and build evidence of outcomes to support full implementation of the schemes and rollout to other catchments in the future – £4m[36].
Drinking Water Quality – Catchment Risk Assessment Programme	Built a dedicated team to assess, investigate and mitigate catchment risks alongside our Drinking Water Safety Planning process. Mitigated drinking water quality risks in the catchments through risk assessments and incentivising sustainable land use.	Continue catchment compliance work for catchments feeding our nine surface water works and 82 ground water works (covering operational and non-operational sources). Compliance risk will be reassessed annually, and mitigation measures developed. Use evidence from risk assessments and stakeholder engagement to proactively manage risks to drinking waters – £3m.
Catchment Management Regulatory Programmes	Ongoing catchment management for groundwater catchments (nitrate) using a combination of partnership working with South Downs National Park, EA, University of Brighton and direct farmer cluster groups (Arun to Adur group). Schemes are also ongoing in seven surface water (pesticides) catchments using Natural England's Catchment Sensitive Farming officers to deliver best practice advice for multiple pollutants. Water quality catchment investigations for 46 groundwater catchments (nitrate) and four rivers (pesticides). Water Resource National Environment Programme investigations and options appraisals to understand the potential Water Framework Directive impacts from our abstractions.	DWI driver: ■ Nitrate Catchment Solution ■ Pesticide Catchment Management – seven surface water catchments. WINEP regulatory driver: ■ WINEP Drinking Water Protected Areas – 20 groundwater sources and three surface water sources will be investigated for substances at risk within these catchments ■ WINEP Drinking Water Protected Areas – 40 groundwater sources and three surface water sources require catchment mitigation ■ WINEP –Water Resource investigations – 87 groundwater sources and four surface water sources will be investigated to assess the risk of Water Framework Directive (WFD) deterioration from our abstractions ■ WINEP – Water Resource implementation – Implementation of measures following AMP6 WINEP investigations for WFD deterioration ■ WINEP – Water biodiversity investigations to support natures recovery – deliver integrated catchment schemes and investigations through AMP7 – £23m.
Enabling and partnerships	Widespread engagement with strategic and catchment	Continue ongoing stakeholder engagement and maximise opportunities for joint design

	stakeholders. Integrated Water Cycle Management (IWCM) project developed tools and instigated culture change. Two IWCM pilots underway. Developing natural and social capital framework. Ongoing engagement with stakeholders to jointly design and deliver solutions. Establishing catchment working groups to facilitate internal integration.	and delivery. Embed natural and social capital into business processes and decision making – £4 million.

(For more information see TA.11.WR03)

Initiatives to reduce leakage by 40% by 2040

Customers have consistently reported that reducing leakage is a high priority and expect us to make our water network more efficient to achieve reduction targets. They tell us that they believe emerging technology will be key in solving key water industry issues, and, in particular, support the use of technology and real-time data to help target leakage. We have increased the level of technology used in our plan to reduce the length of mains renewal required and meet the expected level of leakage performance at lower cost.

Table 7: Leakage reduction examples

Our response	What we're doing (AMP6)	We will (AMP7)
District Metered Area (DMA) scale mains replacement	Water mains replacement of 107 km based on burst mains rates. Moving to a DMA scale replacement approach to maximise leakage reduction and improve service.	Replace over 330 km of water mains, contributing to a 15.1% reduction in leakage by the end of AMP7 – £70m.
Intelligent Networks	Piloting some of these systems at a zonal scale in AMP6. This has included: ■ industry-leading Rownhams water quality sensor trial (including using Artificial Intelligence)[37] ■ satellite imaging for leakage detection ■ acoustic monitors to find leakage.	Implement Phase 1 deployment of our intelligent networks strategy: ■ Deployment of ~ 2,500 quality sensors and automation of critical control valves to improve resilience and improve CRI performance ■ Deployment of ~ 1,000 additional pressure monitors across the network to reduce bursts and leakage ■ Deployment of 10,000 acoustic loggers to find more leaks ■ Deployment of remote sensing platforms (such as satellite and drone imaging) to more efficiently target leakage. Total investment - £30m (including IT infrastructure). Installation of ~ 280,000 smart meter devices to reduce both PCC and customer-side leakage.
Active Leakage Control	Investing over £70m in finding and fixing leaks. Assessing the impact of new reporting requirements. Implementing the Network Management Platform.	Utilise the Network Management Platform in combination with the intelligent network hardware to increase find and fix efficiency (more leaks fixed) – £65m.

(For more information see TA.11.WN04)

11.4 Overview of costs – Our costs are driven by a commitment to sustainability

Our wholesale water investment plan is split between the Wholesale Water Resources and Wholesale Water Network Plus price controls as mandated by the Regulatory Accounting Guidelines[38] and the PR19 Final Methodology[39]. (See Chapter 14 for our overall approach to cost efficiency.)

Total proposed investment for the Wholesale Water Resources price control is £130.0 million[40] (£128.0 million net of grants and contributions). Specific proposals are set out in individual business cases which describe the areas of investment, and the options we considered to deliver the required level of performance. These are summarised below.

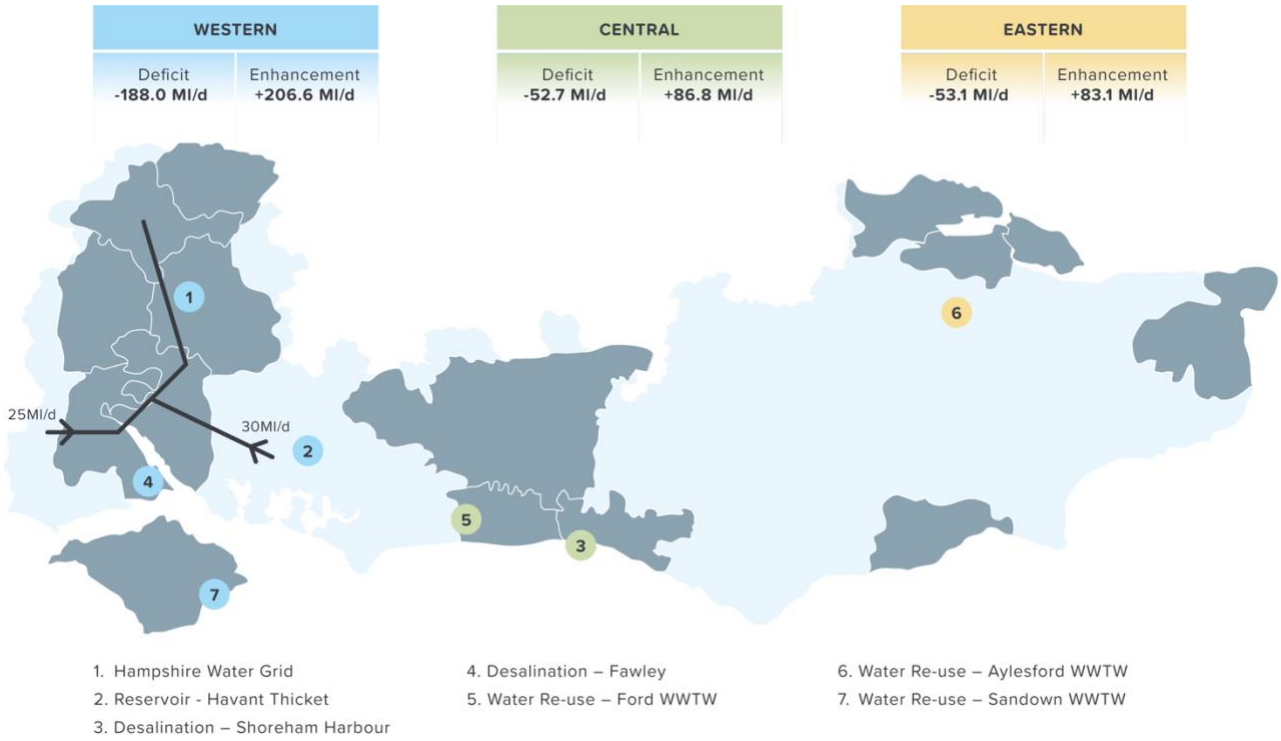
Table 8: AMP7 expenditure – summary of business cases for Wholesale Water Resources

Wholesale Water Resources (gross – 17/18 price base)		Botex		Enhancement	
BC No.	Business case	Totex		Totex	
WR01	Raw Water Pumping	£	55.00	£	–
WR02	Impounding Reservoir	£		£	11.98
WR03	Catchment Management solutions	£		£	31.24
WN02	Nitrate	£	3.41	£	3.11
WN01	Supply and Demand	£	–	£	17.85
MG02	M&G Wholesale Assets IT & General IT	£	4.62	£	–
MG…	Finance / HR / Other	£	2.95	£	–
	Gross Total	**£**	**65.98**	**£**	**64.18**
	Grants and Contributions	£	0.67	£	1.49
	Net Total	**£**	**65.31**	**£**	**62.69**

WN01 Supply and Demand

The biggest challenge facing our water plan is the reduction in available water and the consequent impact on the supply and demand balance. We are responding to this challenge with an ambitious triple track approach that will ensure a resilient future for water in the South East.

Figure 2: Map of our region showing supply and demand balance at 2030, key enhancements, and additional bulk transfers

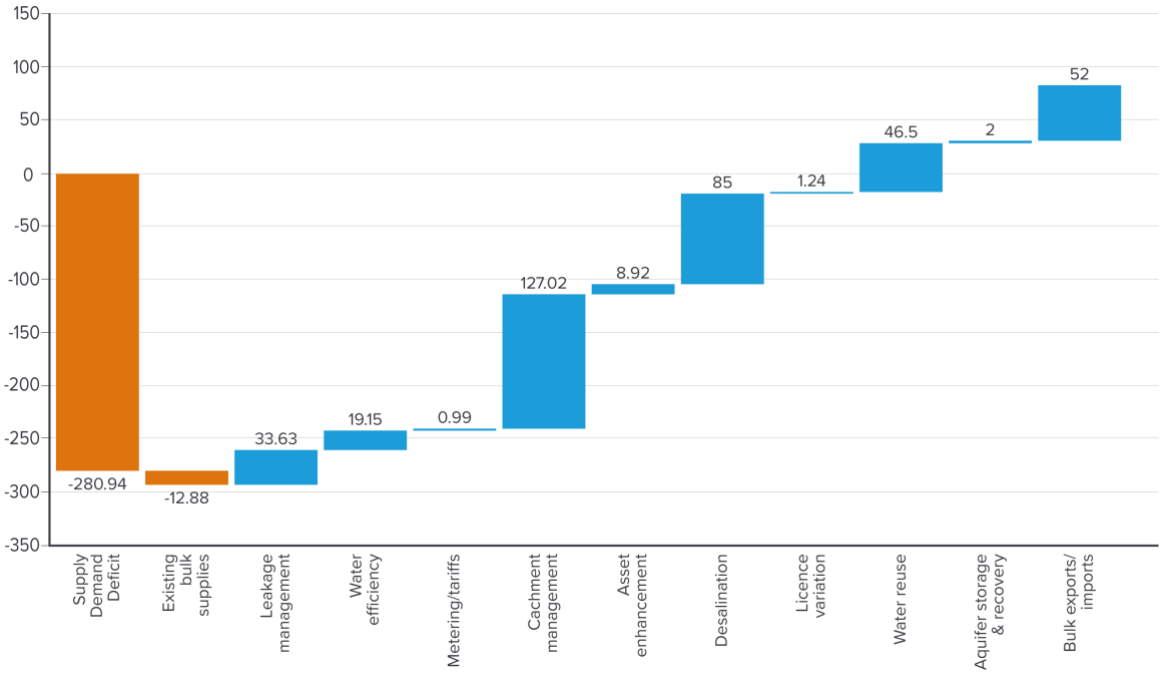


We have been actively working with the EA and other stakeholders to reduce the environmental impact of our abstractions and have agreed significant changes to our licence conditions for abstractions from the Rivers Test and Itchen in Hampshire. When coupled with the impacts of climate change, this will reduce our dry year critical period capacity in Hampshire by 188 Ml/d. This equates to a loss of approximately two-thirds of the current 248 Ml/d capacity[41]. We are also investigating the need to reduce our abstractions in Sussex, which could reduce the water available for use by up to 75Ml/d[42].

As agreed with the EA, we are reliant on drought orders and drought permits to meet this deficit until our major investment proposals can be delivered in 2027. We will commence design and construction of schemes in AMP7, however much of the benefit, in terms of additional capacity, will not be completed until AMP8.

We apply a no regrets approach to planning to ensure customers' supplies remain uninterrupted in all but the most severe droughts. This approach means we will deliver solutions which are required in the short-term, while investigating schemes which may be required in future. This increases our resilience by enabling quick implementation of schemes as their need is confirmed.

Figure 3: Chart showing supply deficit by 2030 and proposed programmes to recover



In considering options for maintaining the supply and demand balance in the future, we have consulted extensively with our customers and other stakeholders[43]. This has resulted in a triple-track approach of reducing demand, increasing supply and using catchment management to protect sources. As detailed in 11.1, our customers' ranked their preferences for supply-side solutions as reservoirs, water reuse, water trading and desalination.

We have set ourselves ambitious targets to reduce consumption and leakage over AMP7 and beyond, which are detailed within the Wholesale Water Network Plus section of this chapter. However, the predicted 76% reduction in water available for use in Hampshire during drought, and further losses in Sussex, requires much higher investment in supply-side options than has been the case in the past.

To help meet this supply side need we have developed a joint proposal with Portsmouth Water to enable the construction of a new reservoir at Havant Thicket. This proposal provides resilience benefits to both companies' customers, and will be funded through a long-term bulk supply agreement with Portsmouth Water for 21 Ml/d. The AMP7 cost to Southern Water customers is £5 million.

Havant Thicket Reservoir Resilience Project – Summary

The £103 million Havant Thicket Reservoir Resilience Project involves the construction of a new winter storage reservoir – the first new reservoir to be built in the South East since the 1970s.

It is a collaboration between Portsmouth Water and Southern Water, through the Water Resources in the South East group, to provide resilient water supplies to the region. It supports reduced abstraction on chalk rivers, has an overall biodiversity net gain and will provide a new community leisure facility for the area.

The project's innovative approach to collaboration and water trading sets a precedent for the water industry and fulfils the recommendations of the National Infrastructure Commission's 'Preparation for a drier future' report as well as being in line with the Government's 25-year environment plan.

The reservoir, which will take up to 10 years to fully commission, will be filled with surplus spring water in winter and allow Portsmouth Water to provide a flexible bulk transfer of around 21 Ml/d to Southern Water, as part of an overall commitment to supply 60 Ml/d from a range of sources by 2029. This will help meet a deficit created by Southern Water's imminent reduction of its abstraction licences on the Rivers Test and Itchen.

It is part of a twin-track approach and both companies have ambitious plans to reduce leakage, help customers use less water and increase metering. A third track is to engage with partners on catchment solutions.

The project, which is supported by and developed with customers and stakeholders, forms one part of a package of solutions which can provide the best value resilient water supplies with the lowest bill impact, compared to other strategies.

Portsmouth Water and Southern Water are also committed to further exploring ways to increase resilience though additional enhancements, such as two-way transfers, to reduce risks from outage and events such as extreme droughts, heatwaves, freeze/thaw and pollution.

It is viewed as the first phase of a longer-term plan to increase water trading opportunities through ambitious demand reduction and the development of further regional infrastructure.

A Design and Build delivery approach is proposed, following a thorough review of alternative options, including a Direct Procurement for Customers model.

Portsmouth Water will deliver the reservoir and some of the associated network upgrades, and the relevant costs recovered from Southern Water through the pricing of the bulk supply arrangement. Despite this being an exceptionally large project for Portsmouth Water, the company will use the existing TOTEX and cost-sharing frameworks to manage the risk to customers.

(To find out more see TA.11.05.)

We have also developed three water reuse schemes to recycle treated wastewater to support river flows. These indirect water reuse schemes are Aylesford (AMP7 £5 million), Ford (AMP7 £10 million), and Sandown (AMP7 £5 million).

We currently import 15 Ml/d from, and export 5 Ml/d to, other water companies[44]. Through our WRMP process we have published our Water Resource Zone deficits and market information tables to enable third-party solutions to be identified. We will continue to use the water resources market to ensure the most resilient and cost-efficient solutions are implemented and will competitively tender our proposed supply-side solutions to ensure best value for customers.

Through AMP7 we will increase our existing bulk supply agreement with Portsmouth Water from 15Ml/d to 24Ml/d, and establish new bulk supply agreements with Bournemouth Water (20 Ml/d) and Portsmouth Water (21 Ml/d), via Knapp Mill and Havant Thicket reservoir[45]. These schemes form part of the Regional Water Grid[46].

Despite making extensive use of water reuse and water trading schemes, a significant supply and demand deficit will remain in our Hampshire and Sussex zones. We are therefore proposing the construction of two desalination facilities at Fawley (AMP7 cost £89 million), and Shoreham (AMP7 cost £9 million).

In response to customer and stakeholder feedback we have sought to maximise the use of more environmentally-sensitive solutions such as water reuse schemes, and demand management options. However, the scale of the deficit we are facing has resulted in less-preferred schemes, such as desalination, being required in order to ensure a resilient service.
(For further details on our approach to optioneering see TA.11.WN01.)

Table 9: Supply and Demand AMP7 investment[47]

Wholesale Water Resource (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
WN01	Supply and Demand	£ -	£ 17.85

Wholesale Water Network Plus (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
WN01	Supply and Demand	£ –	£ 441.32
Key components of AMP7 spend			
WN01	Reducing PCC to 100 litres per person per day by 2040		£ 30.00
WN01	Reducing leakage by 15% over AMP7		£ 33.12
WN01	Havant Thicket		£ 4.97
WN01	Effluent reuse schemes in Sussex and the Isle of Wight		£ 19.65
WN01	Desalination plants		£ 98.12
WN01	Hampshire Grid		£ 110.43
WN01	New Connections and requisitions		£ 102.66
These key components represent a total expenditure of £398.95m, and 87% of the total business case spend			

Note: There is a high degree of overlap between the two price controls for supply demand balance, and therefore in this section we also present the Network Plus component for reference.

In summary the key features of our Supply and Demand programme are:

- planning for more severe droughts than have been historically experienced, using industry-leading models and assessment techniques
- taking better account of uncertainties in supply and demand forecasts by considering a range of possible futures rather than a single scenario, allowing us to identify and prioritise schemes that address the widest possible range of futures
- reducing PCC to 100 litres per person per day by 2040 and reducing leakage by 15% over AMP7
- developing new water supplies including Havant Thicket reservoir with Portsmouth Water , effluent re-use schemes in Sussex, and the Isle of Wight and desalination plants in Sussex, and Hampshire
- improving the resilience of our water supply by developing a regional water grid enabling greater inter-zonal and inter-company transfers. In AMP7 we will start construction of the Hampshire grid, a key first step towards a regional South East water grid.

Our proposed Supply and Demand investment between price controls is in line with the Regulatory Accounting Guidelines[48] and the PR19 Final Methodology[49]. This has resulted in the majority of our larger proposals appearing in the Wholesale Water Network Plus price control. We are proposing AMP7 Totex investment of £17.8 million on Supply and Demand within the Wholesale Water Resources price control[50] and £441.3 million with the Wholesale Water Network Plus price control.

WR01 Raw Water Pumping

This section covers capital maintenance and base Opex investment on our boreholes, wells, raw water intakes and raw water pumping stations.

The failure of a river intake or borehole pump can lead to a loss of supply, reducing the amount of water available for our customers. Equally, a poorly-sealed borehole provides a potential contamination pathway which can lead to the loss of a source or increase the amount of treatment required. Our customers and stakeholders have told us that they expect clean, safe, high-quality water that is as natural as possible [51,52].

Table 10: Raw Water Pumping AMP7 investment[53]

Wholesale Water Resource (Gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
WR01	Raw Water Pumping	£ 55.00	£ -

Key features to drive performance, resilience and efficiency in this area of investment are:

- multi-AMP maintenance programmes for boreholes and raw water
- using catchment management throughout to reduce raw water quality challenges. This will help reduce the risk of long-term outage due to deteriorating raw water quality.

WR02 Impounding Reservoirs

This section includes all capital maintenance and enhancement investment relating to our Section 10 reservoir assets. We have invested to keep all impounding reservoirs and similar structures in good order to meet the requirements of Section 10 of the Reservoirs Act 1975 and the Flood & Water Management Act (FWMA) 2010.

There is one change in legislative guidance in AMP7 which will require significantly more investment than previous AMP periods. This is the new guidance[54] from the All Reservoir Panel (which has powers to issue legal notices through the EA under the Reservoir Act 1975) which will dictate how quickly we can reduce the water level at a number of our larger impounding reservoirs

in an emergency. Our appointed reservoir panel engineer has identified this will require significant civil modifications at some sites to be completed over the next 10 years (aligned to the statutory Section 10 inspections).

We will invest £13.9 million Totex over the AMP7 period. This will be partly funded by a £2.1 million contribution from South East Water, which co-owns some assets.

Table 11: Impounding Reservoirs AMP7 investment[55]

Wholesale Water Resource (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
WR02	Impounding Reservoir	£ -	£ 11.98
Wholesale Water Network Plus (gross – 17/18 price base)		**Botex**	**Enhancement**
Ref	Business case		
WR02	Impounding Reservoir	£ -	£ 1.87

Note: This reflects the component of the Impounding Reservoirs business case funded through the Wholesale Water Network Plus control.

In summary, the key features of our Impounding Reservoirs programme are:

- using innovative solutions to efficiently upgrade our reservoir drawdown
- applying capability to significantly increase resilience in both extreme weather events (storms, floods) and in the event of dam-integrity emergencies.

WR03 Catchment management solutions

This section focusses on the integrated ***Catchment First*** programme proposed for AMP7. This includes WINEP and DWI deliverables alongside our catchment compliance approach and our plans for catchment resilience. (For more information see TA.11. WR03)

We rely on groundwater sources for 70% of our supplies, with the remainder coming from surface water sources. A significant number – 70% – of our groundwater sources have increasing nitrate concentrations and surface water sources carry a risk of pesticide contamination. Both of these challenges are difficult and expensive to remove using traditional treatment options.

As a result, catchment management forms an essential part of our triple-track approach to cost-effectively secure water resources and improve the environment. We are therefore proposing a significant increase in our investment in these solutions.

Our proposed AMP7 catchment solutions are split into seven key areas

1. **Nitrate:** implementing catchment management to manage the rise in raw water nitrate concentrations in 42 groundwater catchments, including incentivising sustainable land use
2. **Pesticides:** implementing catchment management to manage and reduce the volume of metaldehyde (and specific pesticides) in seven surface water catchments
3. **Drinking Water Protected Areas:** carrying out investigations early in AMP7 to determine the source, pathway and receptor of specified substances deemed to be a risk to drinking water quality. Catchment solutions will also be implemented following on from AMP6 investigations
4. **Catchment Compliance:** catchment water quality sampling and risk assessments to inform our Drinking Water Safety Plan (DWSP), followed by implementing mitigation measures to control/reduce risks
5. **WINEP Investigations:** investigating the impact of our abstractions on the environment and implementing remedial work identified in AMP6

6. **Instream Catchment Resilience:** investigating the potential to enhance the form and function of the Rivers Test, Arun and Western Rother, and Medway to be more resilient to drought conditions. Working with stakeholders to improve resilience by naturalising the rivers, increasing flow diversity and creating or improving habitats.
   (The cost for Instream Catchment Resilience is included within WN01 Supply and Demand balance.)

Table 12: Catchment management solutions AMP7 investment[56]

Wholesale Water Resource (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
WR03	Catchment Management solutions	£	£ 31.24
Key components of AMP7 spend			
WR03	Nitrate		£ 5.55
WR03	Pesticides		£ 4.96
WR03	Drinking Water Protected Areas		£ 2.79
WR03	Catchment compliance		£ 3.00
WR03	WINEP investigations		£ 14.92
These key components represent a total expenditure of £31.24m, and 100% of the total business case spend			

Wholesale Water Network Plus

Summary

This section sets out our plans for the Wholesale Water Network Plus price control. It describes how we will deliver our customers' priorities, the options we have assessed and how we will deliver these plans efficiently.

We supplied 540 million litres of high-quality drinking water every day to over 2.5 million customers in parts of Hampshire, Sussex, Kent, and the Isle of Wight during 2017-18. Our current average per capita consumption (PCC) and leakage figures are among the lowest in the UK[57].

Our past performance has been mixed. While we have led in leakage reduction and PCC, our focus on Mean Zonal Compliance has reduced the emphasis on source to tap quality assessment and resilience. We have had some historic issues in this area, but, working closely with the Drinking Water Inspectorate (DWI) we are acting to improve our governance, business processes, reporting and monitoring. Through our Water First programme, we are improving our performance and have committed to become ***brilliant at the basics***. (For more details see Chapter 7.)

Our customers have told us that providing a constant supply of safe drinking water is the most important thing we do[58,59]. They believe we should do all we can to reduce risk to supply, and to remove contaminants that pose a risk to health or reduce water quality.

In response we will invest to control emerging water quality risk, focussing on nitrate, as well as significantly improving our ability to monitor and control our water network through ***Network 2030***.

We aim to reduce leakage by at least 15.1%[60], PCC to 120 l/hd/d, taste and odour complaints will fall by 10%[61], and Compliance Risk Index (CRI) will improve by 60% putting us in the upper quartile, all by 2025[62]

Chapter headlines at a glance

- We will rationalise our water supply network to affordably secure long-term resilience. Through ***Network 2030*** we will build new treatment works in Brighton and Thanet[63] and replace 30 service reservoirs with eight new ones[64]. We will improve the way we monitor and control our network with 10,000 acoustic loggers, 2,500 water quality sensors, and 1000 pressure monitors, allowing us to detect, respond to, and resolve issues before customers are impacted.
- We have worked closely with the DWI to identify investment needs to address deteriorations in our source water quality, particularly with regard to nitrate and pesticides.
- We have developed Water First, our multi-AMP improvement programme, in collaboration with the DWI, to embed public health protection at the heart of our water services. It spans our people, processes, systems, culture, training, risk and information management – supported by asset improvements and expanded catchment management.
- Overall we plan to invest £1,321 million[65] in Wholesale Water (£1,202 million net of grants and contributions), this compares to an AMP6 investment of £950 million net of grants and contributions in 2017/18 prices.

Our planned Wholesale Water Network Plus investment is £1,191 million (£1,074 million net of grants and contributions), compared to AMP6 investment of £799 million net of grants and contributions in 2017/18 prices. This increase is predominantly being driven by the supply and demand deficit. A snapshot of the areas of expenditure are set out below.

Figure 4: Overview of Wholesale Water Network Plus gross expenditure

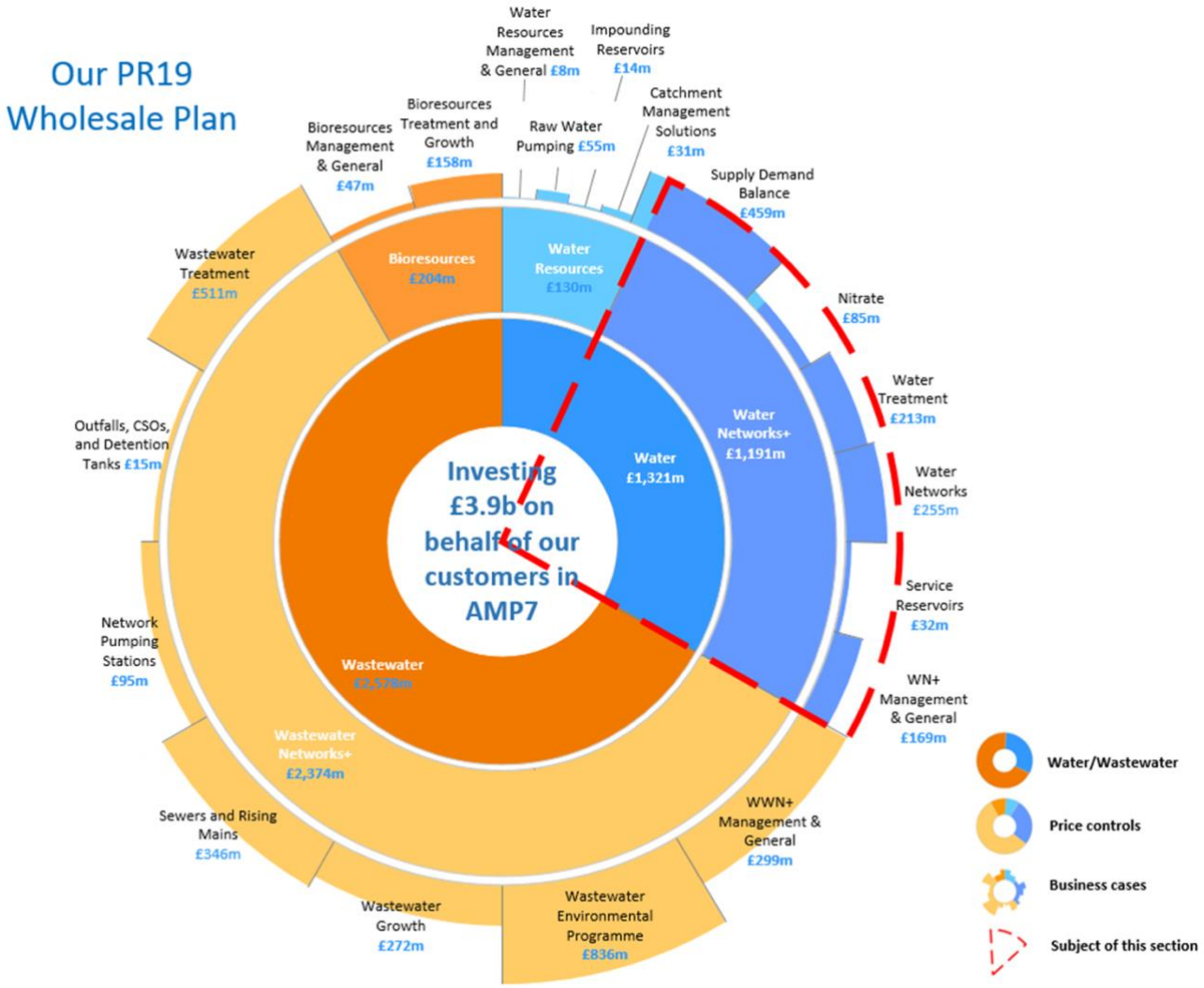


Table 13: Key features of the Wholesale Water Network Plus price control[66]

	Unit	AMP6 (2019/20)	AMP7 (2024/25)
Costs and Regulatory Capital Value (RCV)			
Totex	£m	799	1,074
RCV	£m	954.195	-
Performance			
Water Quality Compliance (CRI)	Score	2.65	0.95
Leakage	Ml/d	105.4	89.6
Drinking water appearance	Contact / 1000	0.92	0.46
Drinking water taste and odour	Contact / 1000	0.24	0.21
Distribution Input	Ml/d	535	506
Replace lead customer pipes	Properties receiving grants	N/a	Up to 14,000
Water supply interruptions	Minutes per property	00:06:11	00:05:30
Asset health: Mains bursts	Nr / 1000km	130	86

Asset health: Unplanned outage	% outage	7%	3%
Water supply resilience	Properties at risk of interruption	59930	38407
Properties at risk of receiving low pressure	Properties at risk	254	254

11.5 Context – Against a background of solid performance, we face significant challenges in the near future

In our AMP6 Business Plan (2015-20)[67] we promised:

- no restrictions on water use, unless there are at least two dry winters in a row
- to reduce leakage to 86 million litres/day by 2020
- no increase in the average time customers are without water
- to aim for 100% compliance with drinking water quality standards
- no increase in the number of households suffering from persistent low water pressure
- to help reduce the effect of hard water in homes and businesses
- to reduce the amount of water we take from the environment
- a 10% reduction in average water use by 2020.

In 2017/18 we met our performance commitments (PCs) on PCC and discolouration, but missed our water quality, and interruptions to supply targets[68]. We recognise our performance in some areas (particularly water quality) has not always met customers' and regulators' expectations. We have therefore agreed a new, more resilient approach to water quality with the DWI that extends from source to tap. We are transforming our wholesale water business to meet these requirements and become ***brilliant at the basics***. This will provide the foundation for our transformational programmes and a resilient water future for the South East.

Further details can be found in Chapter 7 which sets out further details of our Water First programme, which puts public health at the forefront of our plans and will position us to achieve upper quartile performance for CRI in AMP7[69].

A summary of our performance against our Wholesale Water Networks Plus AMP6 PCs is shown in the table below. (For full details see Chapter 17.)

Table 14: Wholesale Water Network Plus AMP6 performance commitments

AMP 6 performance commitment	Actuals 2017/18[70]	Forecast 2019/20	Target 2019/20[71]
No properties affected by temporary use ban (Nr)	0	0	0
Leakage (Ml/d)*	88.7	86.2	86.0
Customer minutes lost supply >3hrs (mins)	17:00	9:00	9:00
Mean Zonal Compliance (%)	99.96	99.97	100
Properties with low water pressure (DG2 register) (Nr)	296	254	257
Contacts regarding discolouration (Nr/1000 customers)	0.82	0.82	0.80
Asset Health	Stable	Stable	Stable
Distribution Input (Ml/d)	541	535	526
PCC (l/h/d)*	129	131	133

* The defintions of a number of common PCs are changing between AMP6 and AMP7. This affects the calculation of both PCC and leakage and means that the levels quoted in Table 12 are not comparable with those quoted through the rest of this chapter.

Our understanding of customer priorities is based on engagement and has formed the basis of our Business plan

As outlined above, we undertook a comprehensive programme of customer engagement to understand customer priorities and how they want us to invest in delivering on those priorities. The provision of clean, safe drinking water was reported by all customers as the highest priority – both in ensuring water quality, reducing wastage and minimising supply interruptions.

(For further detail on our customer priorities see Chapter 4.)

We have assessed the long term needs of government, stakeholders and the environment

Through our extensive consultations, both domestic and business customers have told us that a constant supply of safe drinking water should be a given. They see this as the most important part of our job. These customers have also indicated clear priorities over aspects of their water supply and preferences for where we should focus future improvement efforts, including reducing leakage and improving the quality of water (including the taste, smell and appearance), while protecting the environment and using renewable energy whenever possible[72].

Ofwat's mandatory PCs will enable greater comparison between companies. As a result of methodology changes, both for Ofwat's and industry-wide measures, our comparative industry position will change for a number of metrics. In particular, we will no longer be the industry leader for leakage, although we will continue to be above average. As detailed above our customers have stated a strong preference for us to lead on reducing leakage, so our plan aims to regain our industry-leading position through AMP7 and 8.

We know we need to improve our performance on source-to-tap quality risk assessment. Our holistic, business-wide Operational Excellence programme will rationalise workflows and establish consistent, visible methods of achieving performance and managing risk across separate operational areas. (Further details can be found in Chapter 7.)

Our other challenges include raw water quality deterioration, climate change, aging assets, and population growth:

- increasing nitrate levels affecting the raw water quality at 14[73] of our groundwater sources
- decreasing rainfall with the South East experiencing 730mm of rain a year on average, less than Sydney, Australia (1215mm)[74]
- 43 of our 207 service reservoirs are approaching end-of-life, requiring increasing maintenance or replacement
- a 10.5% increase in population served by 2030[75]
- our PCC[76] and leakage[77] levels are below industry average, but due to water scarcity and customers' priorities we need to drive them even lower
- three of our seven surface water works require major upgrades to protect treated water quality.

11.6 Our AMP7 goals support long term needs

Our Wholesale Water Network Plus PCs are detailed below.
(For further details see Chapter 6.)

Table 15: Wholesale Water Network Plus AMP7 performance commitments[78]

PC	Unit	2020/21	2021/22	2022/23	2023/24	2024/25
Water Quality Compliance (CRI)*	CRI Score	0 (2.31)	0 (1.97)	0 (1.63)	0 (1.29)	0 (0.95)
Leakage	Ml/d	102.3	99.1	95.9	92.7	89.6
Drinking water appearance	Contacts/1000	0.83	0.74	0.65	0.55	0.46
Drinking water taste and odour	Contacts/1000	0.24	0.23	0.23	0.22	0.21
Replace lead customer pipes	Properties receiving grants	Reward-only PC to support joint delivery of lead pipe replacement in customer properties				
Water supply interruptions	Minutes per property	00:06:11	00:06:01	00:05:51	00:05:40	00:05:30
Asset health: Mains bursts	Nr / 1000km	120	111	103	94	86
Asset health: Unplanned outage	%	7%	7%	6%	5%	3%
Water supply resilience	Properties at risk	59930	59930	59930	59930	38407
Distribution Input	Ml/d	525	520	516	510	506

* As CRI is a measure of water quality our target has been set at 0. Our expected profile of improvement is shown for clarity

11.7 How we will get there – Innovation, collaboration and being brilliant at the basics are required for a resilient future

As stated in section 11.3 our customers and stakeholders have told us they want us to work innovatively and collaboratively to deliver their priorities.

Our response is the transformational programmes; ***Catchment First, Target 100, Network 2030,*** and our leakage initiatives, as detailed in section 11.3.

These programmes are integrated across our price controls and are therefore not repeated here.

11.8 Overview of costs – Our costs are driven by a commitment to drinking water quality and sustainability

Our investment plan is split between the Wholesale Water Resources and Wholesale Water Network Plus price controls as mandated by the Regulatory Accounting Guidelines[79] and the PR19 Final Methodology[80] and is detailed below. (For our approach to ensuring costs are efficient see Chapter 14.)

Total proposed investment for the Wholesale Water Network Plus price control is £1,191 million[81] (£1,074 million net of grants and contributions).

Table 16: Wholesale Water Network Plus price control summary

Wholesale Water Networks Plus (gross – 17/18 price base)		Botex		Enhancement	
BC No.	Business case	Totex		Totex	
WR02	Impounding Reservoirs	£		£	1.87
WN05	Service reservoirs	£	31.97	£	–
WN03	Water Treatment	£	213.37	£	–
WN04	Water Networks	£	235.52	£	19.85
WN02	Nitrate	£	16.96	£	61.70
WN01	Supply and Demand	£	–	£	441.32
MG03	Buidings, roads and fences planned	£	17.05	£	–
MG02	M&G Wholesale Assets IT & General IT	£	91.82	£	–
MG00	Finance / HR / Other	£	59.71	£	–
	Gross Total	**£**	**666.40**	**£**	**524.72**
	Grants and Contributions	£	15.31	£	102.16
	Net Total	**£**	**651.09**	**£**	**422.56**

Investment proposals

Our Wholesale Water Network Plus proposals are supported by five individual business cases that provide a description of each investment area, including costs, benefits, risks and opportunities.
(See TA 11.WN01 Supply & Demand, TA 11.WN02 Nitrate, TA 11.WN03 Water Treatment, TA 11.WN04 Water Networks and TA 11.WN05 Service Reservoirs)

WN01 Supply and Demand

As supply-side solutions are detailed within the Wholesale Water Resources price control section, this section focuses on our demand-side proposals.

We are reducing demand by helping our customers to deliver an industry-leading reduction in consumption through ***Target 100***, and by delivering our biggest-ever programme of leakage reduction. This will result in demand reduction of 38 Ml/d in AMP7[82].

Through ***Target 100*** we will increase metered penetration from 87% to 91% across the region. We will move from bi-annual to monthly meter reads to provide the significant increase in data granularity needed to drive behaviour change.

Over AMP 5 and 6 we invested £124 million in Universal Metering to install 450,000 water meters, increasing the proportion of our customers on a meter from 41% to 87%[83].

Recognising this significant investment, we are not proposing a wholesale roll-out of smart meters. Instead we have developed and are testing a clip-on device that can convert existing meters to produce smart data. We will provide this clip-on solution to all customers that want one, funded by a reward-only PC in AMP7.

Table 17: Supply and Demand AMP7 investment[84]

Wholesale Water Resource (gross – 17/18 price base)		Botex		Enhancement	
Ref	Business case				
WN01	Supply and Demand	£	–	£	17.85
Key components of AMP7 spend					

Wholesale Water Network Plus (gross – 17/18 price base)		Botex		Enhancement	
Ref	Business case				
WN01	Supply and Demand	£	–	£	441.32
Key components of AMP7 spend					
WN01	Increased metering penetration			£	13.21
WN01	Monthly meter reads			£	10.63
These key components represent a total expenditure of £23.84m, and 5% of the total business case spend					

Note: A breakdown of this table can be found in the water resources section above (under supply demand balance WN01).

WN02 Nitrate

This section covers the control of nitrate in treated water within our supply network. Following on from our installation of nitrate control measures at five sources in AMP6, in AMP7 we are proposing to control nitrate at a further 14 sources.

Nitrate in water is particularly harmful to babies due to the relatively large proportion of their diet which can come from water. The DWI has therefore set a limit for nitrate concentrations to protect public health. Our customers and other stakeholders, especially our vulnerable customers, say providing clean, safe, high quality water is an absolute basic of any water company[85, 86, 87]. They also told us they want their water to be as natural as possible[88, 89].

Nitrate performance impacts on water quality compliance, measured through CRI. We are forecasting upper quartile performance in CRI by the end of AMP7[90].

Table 18: Nitrate AMP7 investment[91]

Wholesale Water Networks Plus(gross – 17/18 price base)		Botex		Enhancement	
Ref	Business case				
WN02	Nitrate	£	16.96	£	61.70
Key components of AMP7 spend					
WN01	Brighton East Treatment works	£	11.00	£	13.28
WN01	Minster B Treatment works	£	2.51	£	11.78
WN01	SuttonTreatment works	£	0.71	£	9.48
These key components represent a total expenditure of £48.76m, and 62% of the total business case spend					

Wholesale Water Resource (gross – 17/18 price base)		Botex		Enhancement	
Ref	Business case				
WN02	Nitrate	£	3.41	£	3.11

Note: This reflects the component of the nitrate business case funded through the Wholesale Water Resources control.

In summary the key features of our Nitrate programme which drive improved resilience, innovation and customer affordability are:

- modification of our asset management approach from site level to zonal and enterprise level and from short-term to multi-AMP design horizons, leading to more strategic solutions
- construction of two new water treatment works and rationalising our raw water sources to consolidate nitrate treatment within fewer, larger sites, cutting costs and ensuring ongoing regulatory compliance
- increasing the interconnectivity of our potable water supply network, improving resilience and enabling nitrate risk to be reduced
- applying our Resilience Assessment Framework[92] to assess and optimise network resilience
- quadrupling our spend on catchment management, reducing nitrate levels at source in the long term, and reducing costs and the need for plant construction – AMP7 cost £5.6 million.

WN03 Water Treatment

This section covers capital maintenance and base Opex investment at our nine surface water treatment works and 82 groundwater treatment works[93].

There are a number of future trends that will significantly impact water treatment such as population growth, climate change, raw water deterioration and a need to secure resilience.

In addition, the common water quality performance metric used across the industry is set to change from Mean Zonal Compliance (MZC) to CRI. The DWI is also introducing the Event Risk Index, to enable comparison of how companies mitigate and respond to issues. We also recognise the need to improve our levels of unplanned outage. We have started this in AMP6 and will continue to reduce unplanned outage from 7% to 3% across AMP7.

These challenges require us to achieve a step change in performance. We have carried out a holistic review of long-term risks to water quality at a zonal level and developed proposals to efficiently resolve the risks. This resulted in reduced investment in AMP7, while ensuring better performance.

Table 19: Water Treatment AMP7 investment[94]

Wholesale Water Network Plus (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
WN03	Water Treatment	£ 213.37	£
Key components of AMP7 spend			
WN03	Temporary plant and run-to-waste programmes	£ 13.48	
WN03	Refurbishment to surface water works	£ 95.17	
These key components represent a total expenditure of £108.65m, and 51% of the total business case spend			

In summary, the key features of our Water Treatment programme, which affordably delivers improved resilience and innovation, are:

- investing in temporary plant and run-to-waste programmes to improve both the speed of response to, and our recovery from, incidents. This will help reduce unplanned outage whilst minimising capital expenditure and protecting customers' bills
- embedding Hazrev and resilience assessments into our source-to-tap risk identification processes, thereby reducing CRI and ERI
- carrying out significant refurbishment of our surface water works at Otterbourne, Testwood, and Burham, to improve reliability, performance and resilience

WN04 Water Networks

Our investment has improved leakage and supply interruptions metrics and maintained all other water network asset health stability measures. However, as a result of methodology changes, both for Ofwat's and industry-wide measures, our comparative industry position will change for a number of metrics. In particular, we will no longer be the industry leader for leakage, although we will continue to be one of the best.

As detailed above, our customers have stated a strong preference for us to lead on reducing leakage, so our plan aims to regain our industry leading position through AMP7 and AMP8. To achieve this, we will invest in three key areas – mains renewal, active leak control and smart networks.

We are changing our approach to mains renewal from replacing the water main only, to replacing all the pipes within a District Metered Area (DMA), including customers' supply pipes. This will result in entire areas having negligible leakage. We will continue employing active leak control to find and fix leaks. Through AMP7 we will utilise more advanced technologies, such as satellite and drone leak detection to identify and resolve leaks quicker.

We will implement phase one of our smart networks strategy which will see the deployment of 1,000 transient pressure monitors and 10,000 acoustic loggers, together with the automation of 1,000 valves, and implementation of a network management and control system. This improved network visibility will enable us to be more transparent with our customers as well as reducing response times, which will lead to an improvement in customer experience.

(For more detail see TA.11.WN04.)

Table 20: Water Networks AMP7 investment[95]

Wholesale Water Network Plus (gross – 17/18 price base)		Botex		Enhancement	
Ref	Business case				
WN04	Water Networks	£	235.52	£	19.85
Key components of AMP7 spend					
WN04	Pipe replacement	£	30.20		
WN04	Leak detection	£	56.87		
WN04	Lead pipe replacement			£	19.85
These key components represent a total expenditure of £106.92m, and 42% of the total business case spend					

Our programme will reduce leakage by 16 Ml/d[96], marginally exceeding Ofwat's 15% leakage reduction target (a 15.1% reduction[97]). We also considered options to further reduce leakage for AMP7, but this is not supported by our customer insight and would have a detrimental impact on affordability.

In summary, the key features of our Water Networks programme which drive improved resilience, innovation and customer affordability are:

- We will become a quartile one company on all network performance measures with the exception of the Event Risk Index, which will see an improvement from quartile four to quartile two (predicted 7th in the industry)[98]
- We will pilot a project to make lead risk negligible in Deal, Kent by replacing all water network assets (including customer supply pipes), trialling the next generation of Intelligent Network systems, and subsidising lead pipe replacement in homes. We will also replace 28,000 lead

pipes across our region in AMP7 as part of our long-term strategy to eliminate as many as possible by 2045.

WN05 Service Reservoirs

This section includes all capital maintenance and base Opex investment relating to our 207 service reservoirs. Our investment has maintained all service reservoir asset health serviceability measures over the last two AMPs.

We face the challenge of a significant proportion of our service reservoir asset stock (43 of 207) reaching the end of useful life by 2030 (based on structural inspection data). These assets have the potential to pose a significant risk to water quality and be detrimental to CRI performance[99], which would not be acceptable to customers. To address this we will invest £32 million in base Totex over AMP7.

Table 21: Service Reservoir AMP7 investment[100]

Wholesale Water Network Plus (gross – 17/18 price base)		Botex		Enhancement	
Ref	Business case				
WN05	Service Reservoirs	£	31.97	£	-
Key components of AMP7 spend					
WN05	Increased inspection frequencies	£	14.43		
WN05	Constructing new service reservoirs	£	17.54		
These key components represent a total expenditure of £31.97m, and 100% of the total business case spend					

In summary, the key features of our Service Reservoir programme to drive improved resilience, innovation and customer affordability are:

- increasing inspection frequencies from once in 10 years to a minimum of once in five years by 2025 to comply with a DWI notice (SRN3923)[101]
- constructing four new service reservoirs in AMP7 and completing four started in AMP6. This will enable the rationalisation and decommissioning of 30 service reservoirs. This forms a key component of ***Network 2030*** which will ensure we provide resilient and affordable services now and, in the future,[102]
- our programme is designed to ensure we meet the requirements of CRI and targets quartile one performance by the end of AMP7
- our approach delivers the most affordable long-term strategy for our customers, and in AMP7 is cheaper than the next-best alternative approach of refurbish and replace like-for-like. Rationalisation is the most cost-beneficial approach over 10, 20 and 60-year horizons.

MG02 Wholesale IT

Our centralised IT management and general capability provides a shared service across our water network to support the technology hardware, software, networks, data centres, facilities and operational technology devices. Without support from IT, the technology that underpins our water networks will be unable to maintain our services. Furthermore, our aspirational initiatives rely heavily on technology to support our networks as they become smarter as part of our ***Networks 2030*** initiative.

We need to significantly invest in IT to support our business strategy which is focused on shifting how we operate to ensure we become ***brilliant at the basics***.

Table 22: IT AMP7 investment[103]

Wholesale Water Network Plus (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
MG02	IT	£ 91.82	£ -
Key components of AMP7 spend			
MG02	Centralised data capability inspection frequencies replacement	£ 17.0*	
MG02	Cyber security	£ 24.0*	
These key components represent a total expenditure of £41m, and 43% of the total business case spend			

Wholesale Water Resource (gross – 17/18 price base)		Botex	Enhancement
Ref	Business case		
MG02	IT	£ 4.62	£ -

Note: This reflects the component of the IT business case funded through the Wholesale Water Resources control

Highlights from our IT business plan are:

- support for our transformational ***Network 2030*** programme to deploy water quality and transient monitors, through our investment in operational real-time control platforms
- £17 million* of ongoing investment is focussed on maintaining our centralised data capability to improve the way we manage data. We have substantial opportunities to make operational and corporate improvements and enable enhancements to operational awareness and support ***Target 100*** through customer consumption analytics
- we recognise that cyber security is a major threat which leads to an investment of £24 million* in improving information security platforms to protect our customers and their data
- our investment in information lifecycle management defines our ability to enable and support our business in making more informed decisions to safeguard our customer's water supply.

(For further details on our IT investment see TA 12.MG02.)

*Our investment in in the centralised data capabilities is shared across both wholesale waste and water investments.)

11.9 Water Networks Plus dominates our Wholesale Water RCV

Our approach to Regulatory Capital Value (RCV) allocation between the Wholesale Water Resources and Wholesale Water Network Plus price controls has been to use the unfocused net Modern Equivalent Asset Valuation (MEAV) method.

Our proposed RCV allocations as at 31 March 2020 are shown below:

Table 23: Proposed RCV allocation as at 31 March 2020[104]

Price control	Proposed RCV allocation (£m)	Proposed RCV allocation (%)
Water Resources	83.286	8.03
Water Networks Plus	954.195	91.97
Total Wholesale Water	1037.481	100

Technical Annexes:

TA.11.WN01	Supply Demand Balance.docx	Water Supply / Demand
TA.11.WN02	Nitrate.docx	Nitrate
TA.11.WN03	Water Treatment.docx	Water Treatment
TA.11.WN04	Water Networks.docx	Water Networks
TA.11.WN05	Service Reservoirs.docx	Service Reservoirs
TA.11.WR01	Raw Water Pumping.docx	Raw Water Pumping
TA.11.WR02	Impounding Reservoirs.docx	Impounding Res.
TA.11.WR03	Catchment Management Solutions.docx	Catchment Management Solutions
TA.11.1	Wholesale Water benefits assessment methodology and Industry Performance analysis.docx	Water AMP7 comparative industry performance assessment
TA.11.2	Water Horizons – Southern waters Long term Asset Management Strategy.docx	Water Horizons – Southern Water's long term asset management strategy
TA.11.3	Regional Water Grid.docx	The Regional Water Grid
TA.11.4	Water Resource Bid Assessment framework	Water Resources Bid Assessment Framework
TA.11.5	Havant Thicket Reservoir Resilience Project	Havant Thicket Reservoir Resilience Project

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5 Water Resource Management Plan
6 Water Resource Management Plan. Also described in Sections 2& 3 of this Chapter.
7 National Infrastructure Commission Report 'Preparing for a drier future: England's water infrastructure needs (2018)'
8 PR19 Data Table WR7
9 TA.11.3 The Regional Water Grid
10 PR19 data table WS1
11 PR19 data table WS1
12 PR19 Data table App1, WS1, WS12
13 Southern Water Services limited: Annual report and financial statements 2017-18
14 PR19 Data Table WS18
15 Water Resource Management Plan Technical Overview
16 Water Resource Management Plan Technical Overview
17 TA.11 WN01 Supply & Demand.
18 Of only introducing temporary use bans (TUBs) in a one in 10-year drought event
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20 TA.11 WN04 Water Networks
21 TA.11 WN03 Water Treatment, WN04 Water Networks and WN02 Nitrates
22 TA.11 WR03 Catchment Management
23 TA.11 WN04 Water Networks
24 TA.11.2 Water Horizons – Southern Water's long term asset management strategy
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30 TA.11 WN04 Water Networks
31 TA.11 WN01 Supply & Demand
32 TA.11 WN04 Water Networks
33 Great Customer Service chapter
34 Great Customer Service chapter
35 TA.11.2 Water Horizons – Southern Water's long term asset management strategy
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[43] Water Resource Management Plan Annex 1: Pre-consultation and problem characterisation
[44] PR19 data Table WN2
[45] PR19 Data table WR7
[46] TA.11.3 The Regional Water Grid
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[62] PR19 Data Table App2
[63] PR19 Data Table WN1
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[66] PR19 Data table App1, WS1, WS12
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[71] Five-year Business Plan 2015-2020
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[104] PR19 data table WS12